How Swaps Work and Why Issuers Use Them

Introduction to Interest Rate Swaps
California Debt and Investment Advisory Commission
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Agenda

- **What can swaps do for you as a borrower?**
- **What risks do they pose?**
- **How can you maximize benefits and minimize risks?**

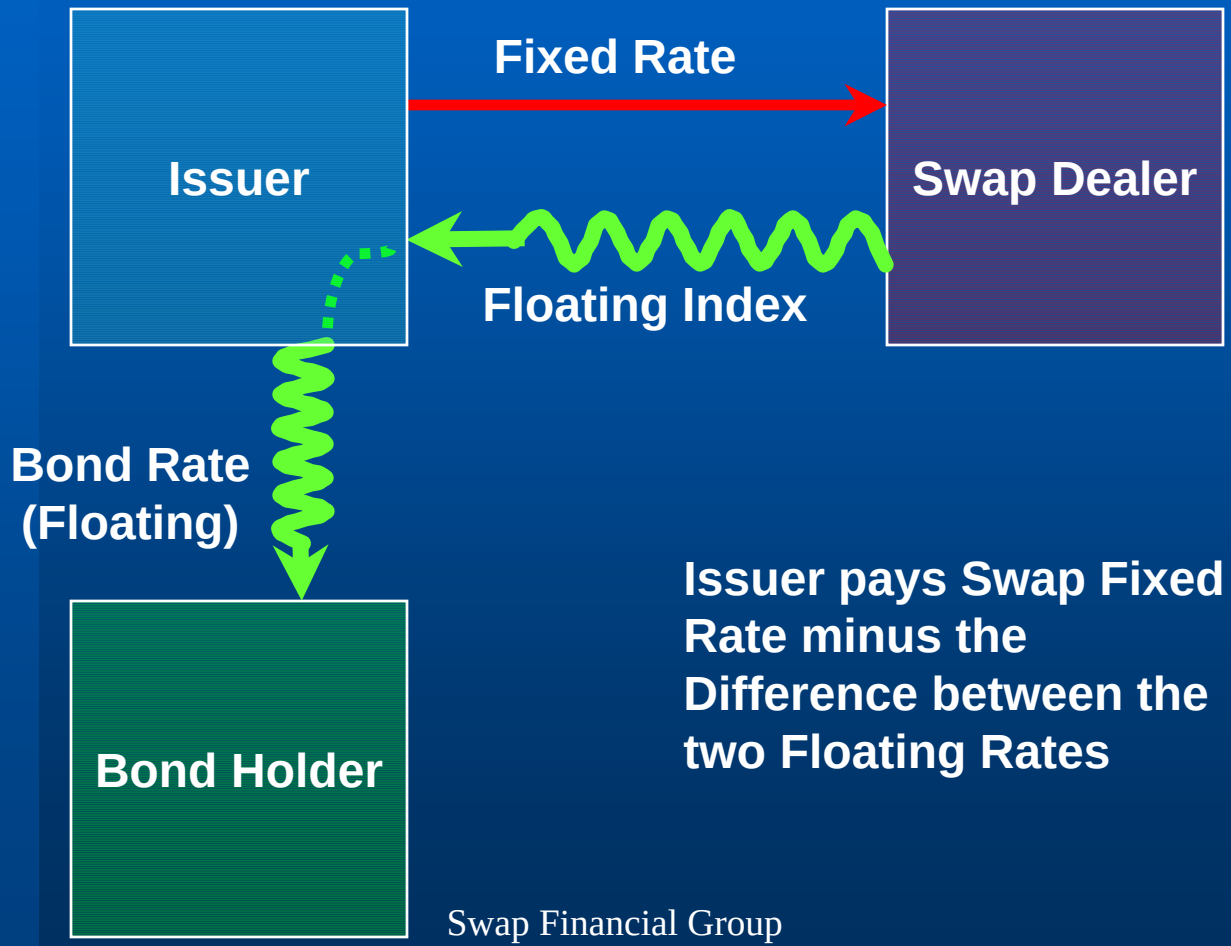
What are swaps?

- **Swaps are an alternative way to access the market for capital**
- **Major borrowers evaluate the swap market and the bond market side by side**
- **Typical swap:**
  - **2 parties (“counterparties”)**
  - **Exchange different forms of interest rates**
  - **Defined period**
  - **Usually, one party pays fixed and the other pays floating**

Why swap?

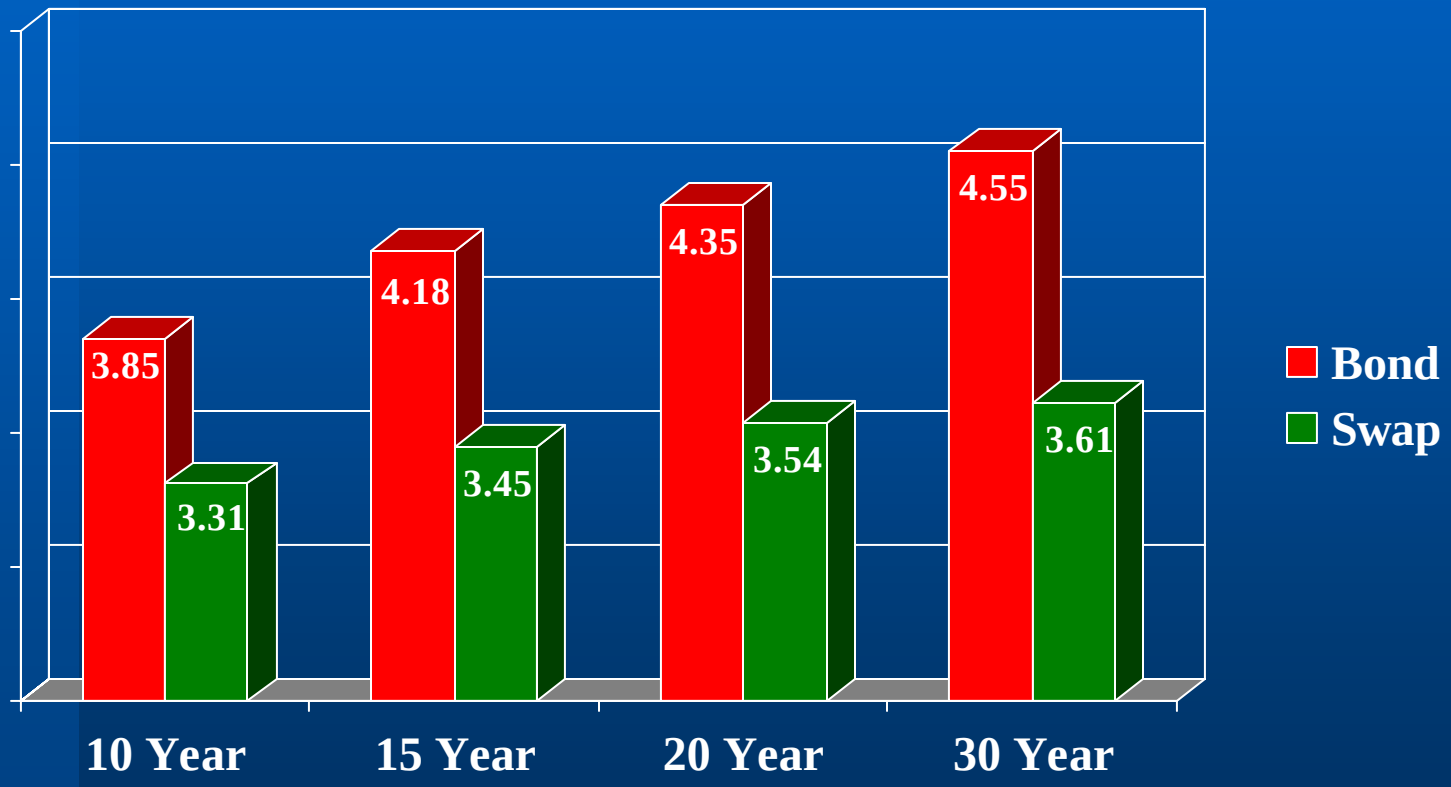
- **Savings: Provide substantially better economic results than those available in the conventional bond market**
- **Flexibility: Provide a solution to a financial problem which is not available in the conventional market**
- **Speed: Take advantage of market opportunity swiftly**

Swap structure (to fixed)



Issuer pays Swap Fixed Rate minus the Difference between the two Floating Rates

Tax-exempt bonds vs. swaps



Note: Swap rate includes 26 bps cost of annual floating bond costs. Prices are illustrative.

Math: Swaps vs. Bonds

- ✓ **Fixed coupon**
- ✓ **+ Amortized cost of issuance**

✓**= All-in cost**

Swap

- ✓ **Floating bond rate**
- ✓ **+ Annual costs of floaters (auction fees or remarketing and liquidity)**
- ✓ **+ Fixed swap rate**
- ✓ **– Floating swap rate**

✓**= All-in cost**

Plug in some numbers

- ✓ 4.55% (fixed coupon)
- ✓ + 0.05% (amortized cost of issuance)

✓= 4.60% (all-in cost)

Swap

- ✓ VR% (floating bond rate)
- ✓ + 0.26% (annual floating bond costs)
- ✓ + 3.35% (fixed swap rate)
- ✓ – VR (floating swap rate)

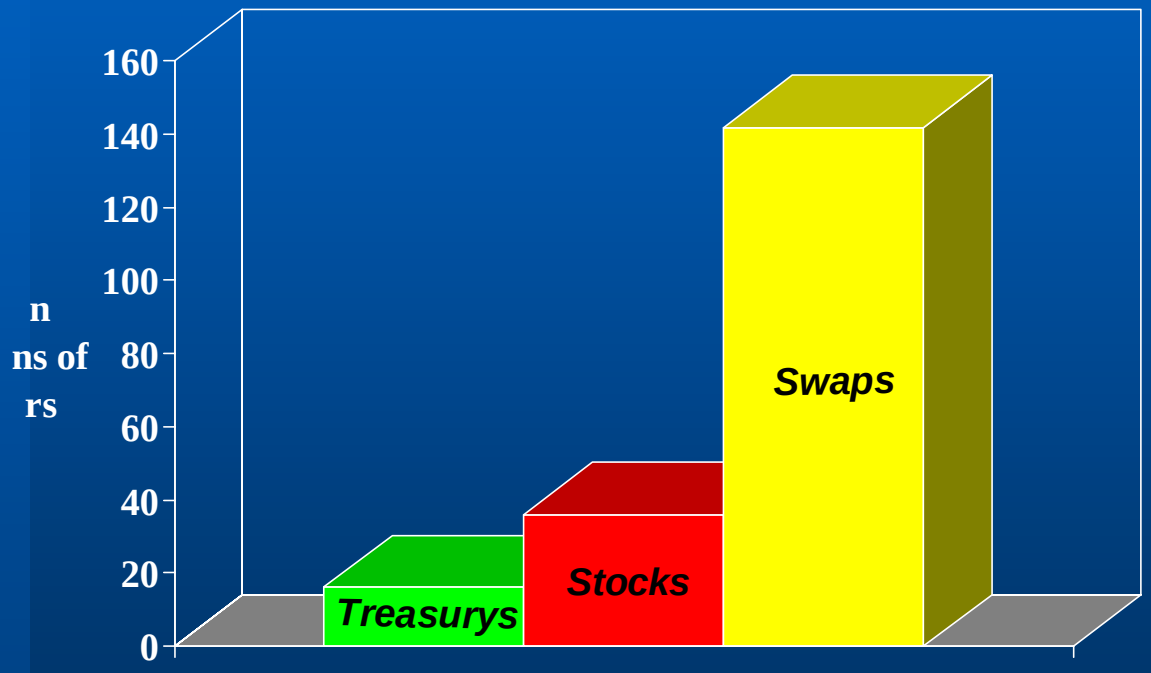
✓= 3.61% (all-in cost)

Why does it work?

- **Counter-intuitive: Why should three steps (issue floating, receive floating, pay fixed) be more efficient than one (issue fixed)**
- **Swaps allow you to “unbundle” and take advantage of relative efficiencies of different markets, and to decide to take certain risks (i.e. greater or lesser amount of basis risk)**
- **Market sensitive: It doesn’t always work**

Inside the Swap Market

A huge, liquid market



Swap market participants

Dealers

Arbitrageurs & Speculators

End Users

Major governmental end-users

- **States: Alabama, Alaska, California, Colorado, Connecticut, Florida, Georgia, Idaho, Illinois, Louisiana, Maine, Massachusetts, Michigan, Nevada, New Jersey, New York, North Carolina, Ohio, Oregon, Pennsylvania, Texas, Utah, Wisconsin**
- **Cities and Counties: New York, Los Angeles, Houston, Chicago, San Francisco, Atlanta, Philadelphia, Miami-Dade, Baltimore, Cleveland, Portland, New Orleans, Orlando, Fayetteville**
- **Many California issuers**

Role of the dealer

- Unable to perfectly match client trades
- Must be “market maker”
- Credit intermediation – one end-user is not exposed to another’s credit
- Processing, bookkeeping, payment calculation

How swap dealers make money

- **Swap dealers don’t make bets - internal rules require traders to hedge most positions**
- **Dealers make money by earning a spread between the price charged to the client and cost at which they hedge (the “bid-offered spread”)**
- **Part of SFG’s job is to demonstrate the level of dealer profit by establishing the dealer’s hedge price**
- **Establishing hedge prices is easiest in the most liquid markets (LIBOR), but is attainable in the BMA market**
- **We believe in a fair, disclosed profit margin, agreed to by the client, in all negotiated deals**

Role of arbitrageur

- **Speculation – pure profit**
- **Looks for inefficiencies**
- **Biggest risk taker**
- **Very picky on timing**

Swap scandals

- **West Basin Municipal Water District, California – Board members indicted, suit against financial advisor**
- **Jefferson County, Alabama – “The Banks that Fleeced Alabama”**
- **Biola University – off-market swap pricing**
- **Philadelphia – City treasurer and lead banker go to jail**

Swap indexes

- **The floating side of a swap is usually an index**
- **Two important floating indexes are:**
  - **LIBOR (London Interbank Offered Rate): Dominant index for taxable floating rates**
  - **BMA (Bond Market Association Municipal Swap Index): Dominant index for tax-exempt floating rates**
- **Many tax-exempt issuers use a percentage of LIBOR (between 64% and 70%) as the floating index, for greater liquidity and savings**

How you get out of a swap

- **The issuer can get out of a swap, or terminate, at any time.**
- **The swap provider generally cannot.**
- **There is no prepayment penalty for terminating early – instead there is a gain or loss, called a termination payment.**
- **The termination payment is based on:**
  - **Interest rates at time of termination**
  - **Remaining years to scheduled maturity**
  - **Notional principal amount**

How termination works

- **Compare original contract swap rate with current market rate for a swap ending on the same date**
- **Multiply rate difference times dollar size and years remaining, present valued**
- **Example: Original rate (5.50%); current rate (4.50%); difference (1.00%) times size ($10 mm = $100,000) times years remaining (10 years = $1 mm), present valued (at 4.50% = $770,000)**

Measuring Termination Exposure

Assume Issuer has entered into a $100 million 30-year swap paying 4.50% and receiving the BMA Municipal Swap Index. The table shows the Replacement Value of the swap at future points in time, assuming 200 and 100 basis point increases in rates, and no principal amortization.

	Remaining Life of Swap		
	10 Years	**15 Years**	**20 Years**
200 basis points	$11,975,000	$14,574,000	$16,994,000
100 basis points	$6,344,000	$7,874,000	$9,432,000

Swap Risks

Counterparty risk

Bonds: Investors take risk to issuer, not vice-versa

Swaps: Both sides are at risk for entire term

The #1 risk on long contracts

Risk Measurement: Replacement cost, not notional principal amount

Counterparty risk mitigation

- **Start with a quality counterparty**
  - **Strong natural rating**
  - **Synthetic triple-A's**
- **Downgrade collateralization provisions**
  - **amount equal to the Replacement Value**
  - **frequent mark-to-market of both collateral value and swap replacement value**
- **Early termination on further downgrade**

Swap dealer universe

- Goldman Sachs
  - GS Capital Markets (Aa3/AA-)
  - GS Mitsui Marine Derivative Products A)
  - tal Services (Aa3/AA-)
  - ML Derivative Products (Aaa/AAA)
  - Stanley
  - MS Capital Services (Aa3/A+)
  - MS Derivative Products (Aaa/AAAt)
  - BS Capital Markets (A1/A+)
  - BS Financial Products (Aaa/AAA)
  - ing Risk Management (Aaa/AAAt)
- Lehman Brothers
  - LB Special Financing (A1/A+)
  - LB Financial Products (Aaa/AAA)
  - LB Derivative Products (Aaa/AAAt)
- Citigroup
  - Citibank N.A. (Aaa/AA+)
  - Citigroup Financial Products (Aa1/AA)
  - Salomon Swapco (Aaa/AAAt)
- JPMorgan
  - JPMorgan Chase Bank (Aa2/AA-)
- UBS
  - UBS AG (Aa2/AA+)
- A few others:
  - Bank of America (Aa1/AA-)
  - RBC (Aa2/AA-)
  - Bank of New York (Aa2/AA-)

Termination Risk

- **Termination Risk is the risk of an involuntary, unscheduled termination of a swap prior to its planned maturity.**
- **Involuntary termination may occur due principally to these factors:**
  - **Swap dealer downgrade (below single-A)**
  - **Issuer downgrade (below triple-B)**
  - **Events of default**

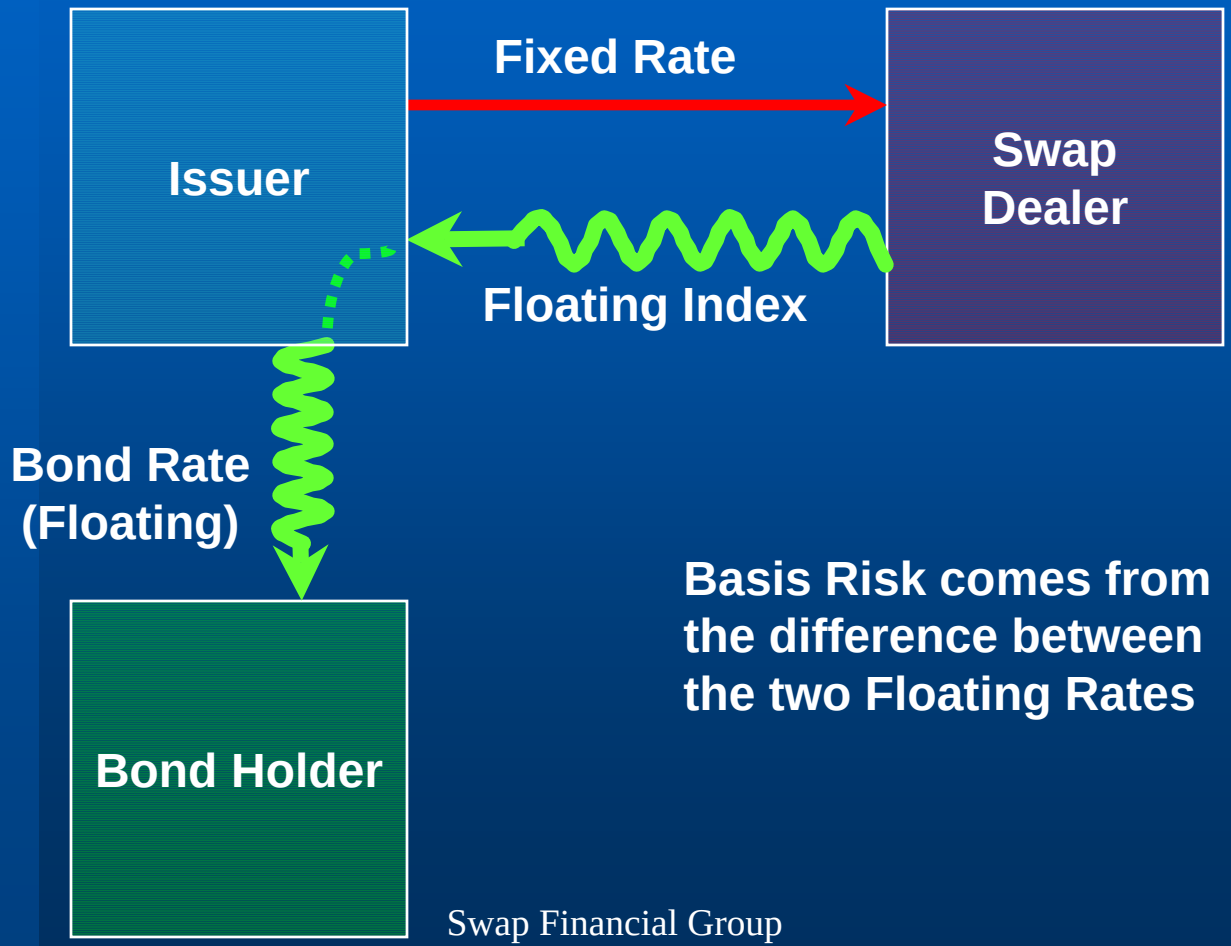
Termination risk mitigation

- **Maintain a low, very remote termination trigger for your own credit**
- **Use of swap insurance requires a downgrade of both your credit and swap insurer's credit to trigger termination**
- **If dealer downgrade triggers termination, termination is on your side of bid-offered spread (you can replace dealer with no out-of-pocket cost)**

Basis Risk

- **Basis Risk is the risk that the floating rate you receive on your swaps doesn’t offset the floating rate you pay on your bonds**

Review of swap structure



Basis Risk comes from the difference between the two Floating Rates

BMA basis risk

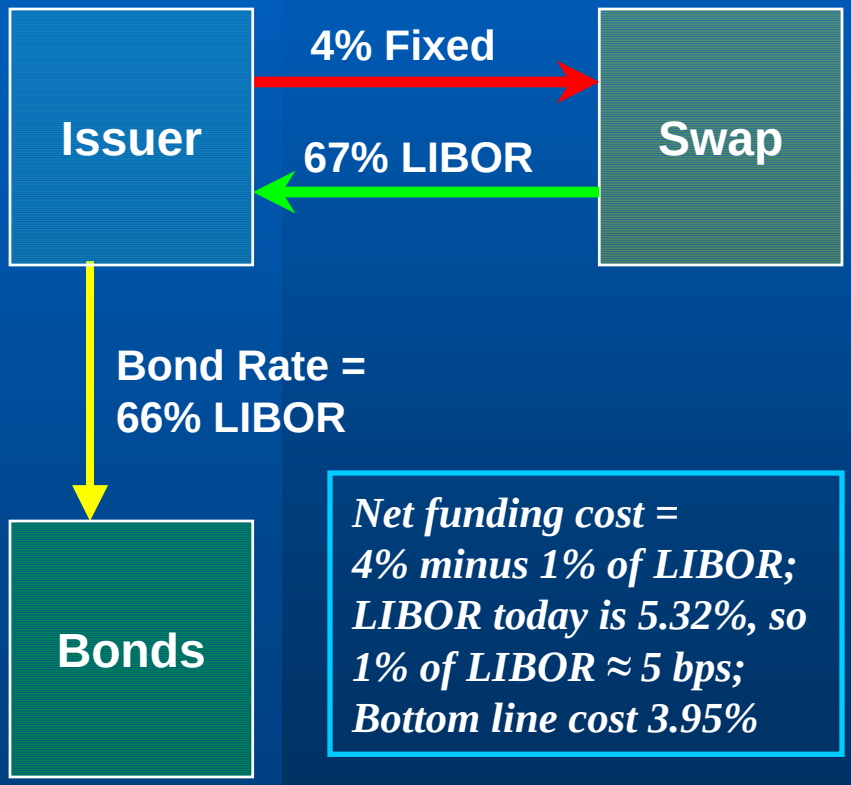
- **BMA Basis risk: BMA (floating rate on swap) fails to cover the floating rate on bonds**
- **BMA normally closely corresponds to actual tax-exempt floaters**
- **Credit events, etc., may cause your bonds to trade worse**

LIBOR basis risk

- **Tax-exempt floaters normally trade at a percentage of the taxable LIBOR index (i.e. 67%)**
- **What would happen if munis lost preferential tax treatment?**
- **Bondholder bears risk with fixed-rate bonds**
- **Issuer bears risk with unhedged floating rate bonds and % of LIBOR swaps**
- **Worst case: Muni floaters trade flat to LIBOR**
- **What happens with % of LIBOR swap: Issuer pays bondholders LIBOR on floaters, receives 67% of LIBOR on swap; net loss of 33% of LIBOR**

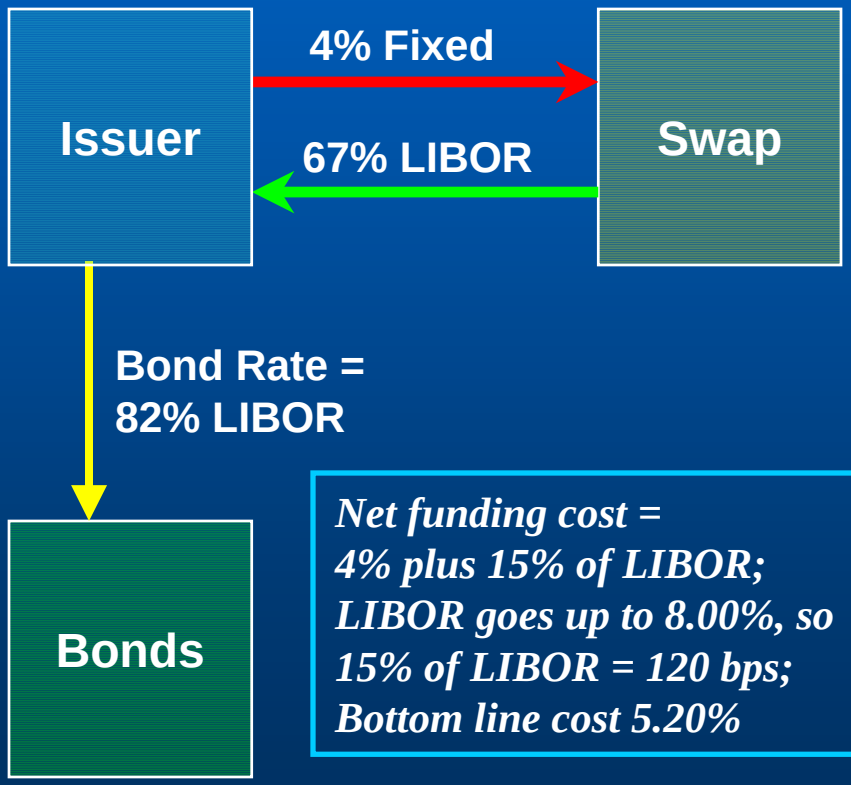
Tax risk scenario

Current Tax Structure



Net funding cost =
4% minus 1% of LIBOR;
LIBOR today is 5.32%, so
1% of LIBOR ≈ 5 bps;
Bottom line cost 3.95%

Radical Tax Change



Net funding cost =
4% plus 15% of LIBOR;
LIBOR goes up to 8.00%, so
15% of LIBOR = 120 bps;
Bottom line cost 5.20%

Tax risk events

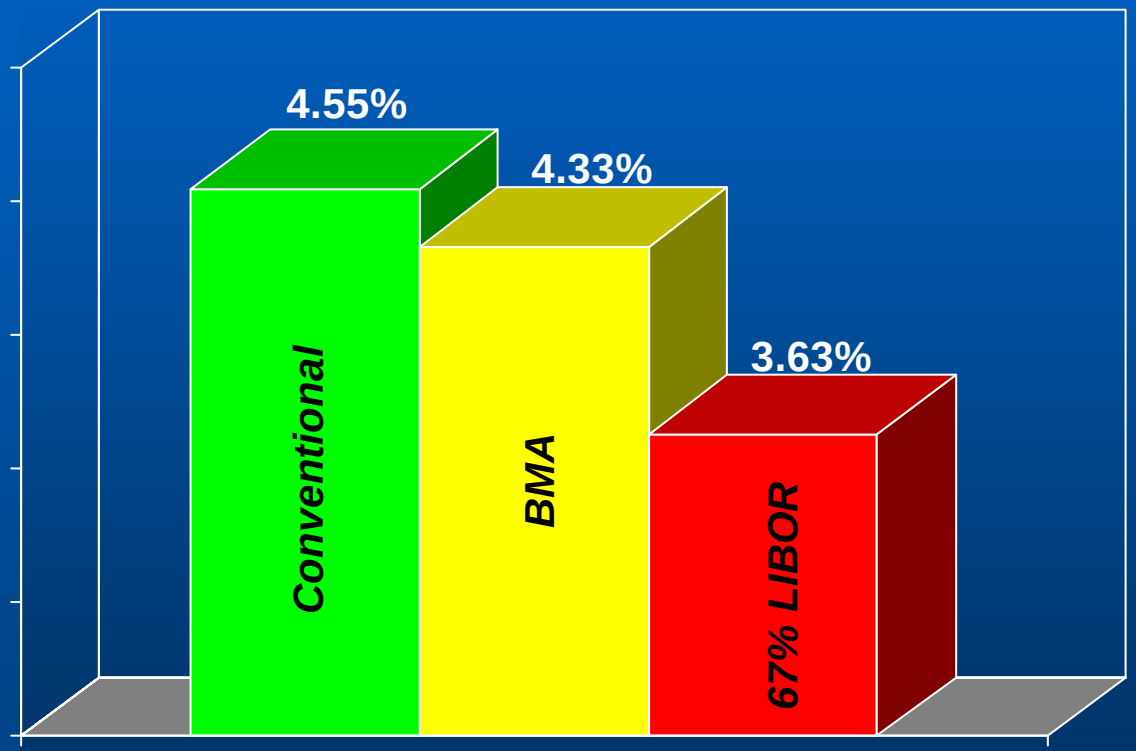
1. **Small effect: Reduction in federal rates**
2. **Larger effect: Exemption of all investment income – corporate bond interest, dividends, capital gains – from income tax**
3. **Largest effect: Taxation of munis under a Flat Tax, with no grandfather clause**

Key Questions: How real is the risk? Does the benefit more than compensate for the risk?

Assessing tax risk

- **The tax risk in a tax-risk swap is no different from the tax risk you take on today with floating tax-exempt bonds.**
- **If munis lose their tax-exemption, floating rates will rise relative to taxable rates.**
- **Tax risk swaps allow you to unbundle tax risk from floating rate risk -- you can hedge against rising floating rates but retain the risk (and significant rate benefits) of drastic changes in the tax code**

Many markets reward LIBOR users



Getting a Fair Price

How swaps are priced

- **All swaps can be modeled to determine the "mid-market" level (halfway between the bid and the offered)**
- **Establishing mid-market can be done by most swap professionals for simple structures**
- **Complex structures require heavier systems, better data flow, and more experience**
- **Once mid-market is established, the key question is the dealer's "spread"**

Dealer's "spread"

- **Cost of hedging: Usually 1 to 3 bps**
- **Credit reserve:**
  - **Excellent credits – less than 1 bp**
  - **Middle credits (AA- to BBB+) – 2 to 5 bps**
  - **Weak credits (BBB and below) – 6 to 15 bps**
- **Profit: Wide variation – 3 to 20 bps**

All elements should be fair and disclosed to you